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ORIGINAL ARTICLES.

SOME OF THE FAILURES IMMEDIATE AND REMOTE MET WITH AFTER CATARACT EXTRACTION.

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THOSE of us who can not obtain the advantages of a special hospital are called upon to perform operations for cataract in the surgical wards of a general hospital, in medical college clinics, and in all kind of private dwellings; often in country towns where, after the operation, we occasionally never see the patient again, or only for the first few dressings; under such conditions it is impossible to follow out the cases, note the course of healing and the visual result.

Attention to detail largely governs the measure of success which attends all surgical operations, and this is conspicuously true of cataract extractions. With a thorough cleansing of surrounding parts, as well as the field of operation, sterile instruments and sufficient manual dexterity, uncomplicated cataract gives us little concern as to the outcome. When failures do occur a careful study of the causes leading thereto may prevent a repetition at some future time of the same error.

My personal experience comprises 141 operations, many of them performed under the most adverse circumstances, and yet the complete failures in uncomplicated cases have been few.

My early hospital training led me to adopt the combined

method of extraction, yet I saw the simple operation lead to brilliant results in the clinics of DeWecker, Galezowski and Panas. Of the 141 cases 36 were simple extractions. In 77 cases one eye only was operated upon; in 32, both eyes, at different sittings; 44 cases were among the colored race, and 97 were whites. All of them were done under local anæsthesia from cocaine.

In operating by iridectomy, the incision was made as near the sclero-corneal line as possible, including about one-third of its circumference, with a small conjunctival flap when it could well be obtained, usually central-crossed lacerations of the capsule, and great care in the cleansing of the incision of all particles of shreds and débris. In the simple operation the incision was aimed to be slightly larger and farther forward in the cornea, especially at its summit.

The conditions have been such that accurate final visual results have not been obtained in at least one-fourth of the cases, in many others only when discharged from the rooms. The failures, however, have been vividly impressed upon me and, therefore, were watched in detail.

These consist in 3 failures from primary corneal suppuration or wound infection; 1 from hæmorrhage from the iris; 2 from suppurative irido-choroiditis, starting in the scar of an iris prolapse sometime after an apparent success; 2 directly from the results of secondary operations.

The first case lost was from primary corneal suppuration early in the series. Mrs. Taft, aged 58 years, was operated upon early in May, 1887, by the modified Graefe method, with but little traumatism, and no complications during the operation. The hygienic conditions were not good, but care was taken to thoroughly cleanse the surroundings an l flood the eye with boric acid solution. The ordinary flannel bandage over a gauze and cotton pad were the dressings. The next day she complained of some discomfort, but the dressings were not removed until the second morning. On inspection the corneal lip of the wound was seen to be hazy, and no effort in the formation of the anterior chamber was apparent. Hot compresses were applied, and 10 grains of calomel were given. The same afternoon showed extension of the corneal haze and beginning necrosis. In two days more the iris was involved, and panophthalmitis supervened.

Why this eye should have been lost and others in which far greater defects in my operative technique occurred, seemed beyond explanation, since a successful result was obtained in the fellow eye six months later, the only added precaution being a preliminary iridectomy.

The second case lost primarily occurred in Mrs. Chapman, aged 62 years, and was badly complicated. The right eye was atrophied from trachomatous corneal ulceration, and the left cornea was slightly hazy and vascular. Extensive entropion and trichiasis existed in both eyes. In May, 1891, I did a plastic operation on the upper lid of each, following the method of Green. After this, prolonged treatment with copper brought about subsidence of the irritation, and an extraction by iridectomy upward was carried out. Notwithstanding all precautions in the way of asepsis were followed, the wound refused to heal, the cornea became hazy and panophthalmitis destroyed the results of my long and tedious attempt to give this unfortunate woman one useful eye.

My third patient, Mr. O., with senile cataract, mature in the right eye but with useful sight in the left, was seen in 1891. He was suffering from chronic lachrymal abscess in both eyes, the canaliculi had been slit years before and on pressure, pus in quantities was extruded. For four months I treated the lachrymal disease by probing with Theobald's probes up to No. 12, and washing with boric acid and astringents. The pus was apparently overcome, and at times only mucoid material could be forced out. As a preliminary to the operation, washing out the lachrymal canal with bichloride solution, $^1/_{3000}$, was made. Twenty-four hours afterward the dressings were removed and all looked well, on the second dressing pus was found regurgitating from the sac, but beyond considerable irritation, no infection was apparent; on the third day, however, the wound began to show some infiltration. All dressings were now removed and the eye irrigated every two hours with bichloride solution, but the infection gradually progressed, the iris became involved and suppurative irido choroiditis closed the scene.

All operators are aware of the danger of infection in lachrymal abscess cases, and while in the hands of some it has not been a serious complication, to my mind it is a grave one. Von Rothmund, in 1420 extractions, encountered it 8 times—

none of these were lost, yet, beyond opening the canaliculi and probing with Weber's probes, no special precautions were taken. In 8 consecutive cases, Collins report good results from daily syringing the canal with boric acid solution. Streatfeild says the danger is almost as great when there *has been* lachrymal obstruction as when the pus is obviously present, because a discharge will reappear after the operation and pus be found before the wound in the cornea has healed. Therefore he advises that the sac be opened and destroyed by the galvanocautery as a preliminary to all operations involving the cornea. Less radical measures have proven successful in the hands of others. Berry and Schweigger have had successful results from opening up the sac and packing it with iodoform at each dressing, filling the inner canthus with powder. Kirschbaum advises that a strip of iodoform gauze be inserted in the sac, filling the inner canthus so as to draw all deleterious secretions in the sac away from the conjunctiva. I succeeded in one case by washing out the canal with formol solution, $^1/_{2000}$, and leaving off all dressings on the second day, thus lessening the danger of pus accumulations in the sac.

Within the last few years a number of observers have reported loss of eyes from hæmorrhage immediately after the extraction. The source of the blood varies in different cases. For instance, Hotz, Spalding, Wadsworth and others report cases where the blood unquestionably came from the choroid; on the other hand, Fryer and Baldwin's cases were apparently from the cut iris. Oliver has reported a case where excessive hæmorrhage from the iris occurred two weeks after the operation, and recurred; good vision eventually resulted.

My experience included one case. Miss S., probably 65 years old, was brought to me in 1893, blind in the right eye from mature uncomplicated cataract, the left eye with beginning lens changes. She was spare built with a flabby skin and a peculiar sallow complexion, and a history of rheumatic attacks; no organic kidney disease. On physical examination of the eye I could find no cause for refusing an operation, which was done the same afternoon, as her family physician was anxious to return home, and the patient was too timid to have the operation done without his presence. The surrounding parts were well cleansed with bichloride solution and the conjunctiva irrigated with the same a few hours before the

time set for the operation. The incision was nearly in the sclero-corneal margin with a small conjunctival flap, an iridectomy and laceration of the capsule were quickly followed by the exit of the lens; considerable blood filled the anterior chamber obstructing a view of any cortical remains. Much difficulty was encountered in cleansing the cut of blood-clots, and irrigation along the incision became necessary. The eye was now bandaged. The patient had been operated upon in bed, and no exertion on her part was therefore necessary. The next day the dressings were removed, these were slightly discolored with blood corresponding with the canthal slit. On examination of the eye, the anterior chamber was found still filled with blood, and the incision occupied by a blood-clot; an effort to remove this failed, because of the resistance of the patient. The eye was washed out with a bichloride solution, $^{1}/_{3000}$, and again bandaged as firmly as comfortable. The blood absorbed slowly, and the lips of the wound pouted and contracted tardily, but no infection occurred. At the end of ten days there was still some blood in the anterior chamber, and a band of organized lymph occupied the wound, the pupil was not influenced by atropia, and a mass of blood, lymph and capsule filled the coloboma. The wound now began to contract, and in four weeks she returned home the eye still irritable. Three and a half months later she came back to me, the eye was free from redness and partial flattening at the seat of the incision had taken place, a brownish membrane filled the pupillary area, perception of light was present. I refused to make a secondary operation because of the danger of farther phthisis. The left eye was subjected to operation without iridectomy, no complications occurred and vision of $^{6}/_{XV}$ was obtained.

Within the last decade the advocation of simple extraction by leading operators connected with large ophthalmic hospitals has brought it into general use even by the beginners in eye surgery who possess none of the advantages in the after-care of their more fortunate teacher. From an æsthetic standpoint, there is no question of its superiority over the operation with iridectomy, but the danger of prolapse outweighs its other good points. Looked at from any standpoint, prolapse of the iris is a serious menace to the eye. If small and left to contract, the recovery is slow, and useful visual acute-

ness interfered with by the very great amount of astigmatism, which is slow in lessening. It is not always possible to prevent the iris from cicatrizing in the wound in any form of operation; the leakage of aqueous may carry a portion of the coloboma into the incision at any time before the complete closure of the corneal wound; but in simple extraction when prolapse occurs, the lymph binds the iris at the angles and prevents it from being disengaged even after the protruding portion is excised. Microscopic examinations by Becker of 38 cases of cataract extraction, eyes removed after death, showed in only one-third of the cases absence of the iris tissue in the scar.

Nothing can be more deplorable to the ophthalmic surgeon than to see an eye after it has obtained sight, lost by a violent purulent infection starting in an incarcerated iris. Schoeler says that cases of prolapse should be watched, since infection through incarceration and loss of the eye may occur after years.

Knapp states that the iris prolapse in cataract operations very rarely occasions the loss of the eye. In a synopsis of 1000 extractions with iridectomy, he speaks of two cases lost long after the operation through suppuration starting in a bit of incarcerated iris in the angle of the scar. Since the simple operation has become more popular, such accidents must necessarily become more frequent. My experience with this operation has been exceedingly disastrous. In 36 simple extractions, two eyes were destroyed long afterwards by infection starting in a mass of engaged iris.

CASE 1.—George S. Moore, aged 59 years, was operated upon by simple extraction in December, 1891. The patient was timid, and just as the lens was passing through the incision a sudden grip of the lids forced it out and with it a small quantity of vitreous. The iris corresponding with the incision seemed to sink back against the ciliary body and disappear. I cleansed the wound as best I could without further loss of vitreous, and bandaged the eye. The next day when I dressed the eye the iris had come forward and was caught in the inner corner of the incision, but for fear of more vitreous being lost, I did not excise it. The eye recovered slowly and the prolapse flattened, but considerable astigmatism existed for some time. In June, 1892, six months after, I ordered permanent

glasses. Javal showed six degrees of astigmatism against the rule, but with +12 D. spherical combined with +3 D. cylinder axis 15°, V.=$^{6}/_{IX}$ and a+4 D. added to this gave Jaeger No. 1. In November, 1893, I operated on his right eye, making an iridectomy. Eleven weeks afterwards my record reads: R. E. with +12 D. spherical V. =$^{6}/_{V}$, L. E. +12 D. spherical combined with +2.25 D. cylinder axis 15°, V. =$^{6}/_{VI}$.

In July, 1896, during a protracted season of high temperature, I was called to see him. He had been in great pain for 24 hours with the left eye. I found a purulent iritis well advanced, which seemed to have as its focus the old point of incarceration. The vitreous rapidly became infected, and panophthalmitis supervened. Before this latter condition was well established, enucleation was advised, but examination of the urine showed such large quantities of albumen and casts that it was thought best not to incur the danger of an anæsthetic, so the eye was allowed to atrophy. The patient is still enjoying useful sight with one eye. No further examination of his urine has been made, but I see him on the streets apparently in good health.

Case 2.—A. T. Brentlinger, aged 45 years; this case was of a similar nature. In December, 1893, I operated on his left eye at the clinic of the University of Louisville, with iridectomy and a peripheral corneal incision. The patient was a model one in every way, and in one week the eye was practically well. Four months later he came to my office and requested that I operate on the other eye, as it was now useless to him, and his occupation as a carpenter had been seriously interfered with, he having to depend on one eye and that with no accommodation. He further complained of the excessive glare in the eye operated upon. I agreed to operate by simple extraction if he could be placed in an infirmary. Accordingly I operated a few days later. No accident of any kind occurred during the operation, the iris came out with the lens and was easily replaced, a central round pupil being obtained. At my first dressing I found a small prolapse into the wound, but it did not protrude, and was not excised. This gradually enlarged until quite a good sized bead presented. The eye was slow in healing, the protruding iris gradually contracted, and V. = $^{6}/_{XVIII}$ was obtained.

In October, 1894, I did a secondary operation on the cap-

sule in each eye. No reaction followed. The vision was improved, but my record of that date has been lost.

In August 1897, I was asked by Dr. Lederman, Chief of the Eye Clinic of the University of Louisville, to see this man at his home. The history was that he had been seeing well with both eyes until three days before, when working in the hot sun he perspired freely, and the perspiration got into the eye and it became very irritable. The night following it pained him very much; the next morning he could not see with it. He applied at the clinic and was given a solution of atropia and an eye wash. The following day Dr. Lederman saw him, and recognized a purulent iritis starting in the iris adherent to the old corneal wound. When I saw him all the uveal tract seemed to be the seat of purulent infiltration, and enucleation was advised to shorten the pain. Examination of the urine showed an excessive amount of albumen present, and the operation was deferred. For several days he was in much pain, and a condition of stupor and mild insanity supervened. He eventually recovered and returned to his work. A recent examination showed the right eye phthisical. The left is free of all irritation, clear central slit in capsule and well-formed coloboma. V= $^{6}/_{XII}$ with +11 D. spherical combined with +1.75 D. cylinder axis 170°. Urine examination showed absence of any evidence of kidney disease.

Arlt and Leber attribute such results as these to septic inoculation in a cystic scar.

Wagenman was the first to thoroughly examine these cases. He reports 13 cases in which suppurative hyalitis occurred at periods varying from a few months to some years after the healing of an operative wound or a prolapsed iris. Extraction of cataract and iridectomies for glaucoma were the most frequent causes. He propounds three hypotheses: (1) The micro-organisms may have entered the wound before it was healed and remained inert. (2) The organisms may have invaded the cicatrix from the circulation and found in these tissues the point of least resistance. (3) The cicatrix may have become newly infected. The latter theory he considered the most probable.

It has been stated that since cystoid cicatrices occur when the lines of incision invade the sclera and never when the cornea, that if the incision is placed properly no such sequela

can occur. In opposition to this may be mentioned the case reported by Berry, wherein the eye was lost nine months after a successful cataract operation in which the wound was corneal and no prolapse, but the iris apparently adhered to the inner lip of the wound. All of us have seen similar destructions of the eye starting in old prolapses from corneal ulceration.

Berry further reports a case from the Clinic of Argyll-Robertson, and states that both cases were exposed to great heat before the outbreak of the septic infection.

The two cases that I have just reported occurred in extreme summer weather, and one subject explained his trouble by the fact that he worked in the very hot sun and the eye became inflamed from perspiration. It appears that the irritation from the extreme heat produced a conjunctival irritation of such a character as to act as a fertile soil for organisms which, through some slight traumatism, invaded the scar and spreading from thence to the iris and vitreous produced general septic infection of the contents of the globe.

Scarcely of less gravity than extraction of the opaque lens itself, is the operation for the secondary capsular membrane. Recognizing this fact, removal of the lens in its capsule has its advocates, preferring to risk the loss of vitreous and its possible after-results rather than to incur the dangers incident to secondary operations. Removal of the anterior capsule by the forceps method of DeWecker is certainly an advance, provided it can be accomplished in all cases.

Peripheral capsulotomy as advocated by Knapp must necessarily be followed by the largest percentage of secondary operations. For instance, in his second hundred of simple extractions, 74 per cent required after interference. Landolt, from a review of the experience of many operators, comes to the conclusion that secondary capsule operations are more dangerous than the extraction itself.

The amount of visual acuteness contraindicating a secondary operation, is a question of importance. Whenever the visual acuteness is $^{6}/_{XXIV}$, or better, I have refrained from interference. My experience with secondary operations is confined to 53 cases. Of these, two were lost completely, and in a third the vision was far worse as a result of the interference.

The first was that of Ruth R., colored, aged 71 years, extraction in March, 1896, at the University Clinic. As the

corneal incision was finished, she violently squeezed the eye and the lens, together with the iris and a quantity of vitreous, was forced out, the lens rising into the air and falling on her cheek. I quickly removed the speculum and succeeded in excising the protruding iris with a large bead of vitreous, and partially approximating the wound. Notwithstanding this accident the eye promptly healed. The violent muscular effort had ruptured the capsule in a horizontal direction just above its center. The lower portion contained a mass of opaque lens material remaining in the capsule. Three months later a test of vision showed $^{6}/_{LX}$. I attempted, with Knapp's knife-needle, to make a crossed incision in the opaque area; the horizontal incision was without incident, but when I attempted the vertical slit the membrane appeared to yield slowly, and as I withdrew the knife, a retinal detachment floated into the pupillary space. The ultimate visual result was perception of light only. Recently I operated on the fellow eye without incident.

The second one lost was even more unfortunate. Mr. E. B. Russell, aged 79 years, extraction with iridectomy, March, 1896, right eye. Twelve days later vision was with +10 D. spherical, $^{6}/_{XX}$. He returned to his home and I saw nothing more of him until December, when he came to me, complaining of failure of vision in the operated eye. With his glasses V. $= {}^{5}/_{LX}$. Oblique illumination showed thickened membrane in the pupillary space. He was sent to the infirmary, his eye prepared for operation by thorough cleansing of the surroundings and irrigation of the conjunctival sac with boric acid. A T-shaped opening with Knapp's knife-needle, under artificial illumination was made. The eye was irritable for three days, but the pupil responded to a mydriatic, a cloudiness began in the vitreous, and in twenty-four hours a suppurative hyalitis destroyed the eye. In April, 1898, I operated on his other eye with useful vision resulting.

In one other case, after a simple extraction and with V. $= {}^{6}/_{LX}$, a secondary operation was followed by acute glaucoma which was relieved by eserine and paracentesis, but the vision was never as acute as before the secondary operation. The only explanation for Knapp's great success in secondary operations must be due to the fact that he usually makes this oper-

ation not later than six or eight weeks after the primary extraction.

I have dealt entirely with the dark side of cataract operations, hoping more could be learned from a study of failures than from tabulation of the results in cases following the normal healing process. My observations do not coincide with those of men of greater experience, especially on the influence of prolapse of the iris upon the future well-being of the eye, judging by the following extract from a recent writer of large and varied opportunities:

"Corneal fistulæ are rare, and have never yet been shown to produce purulent intraocular inflammation. It is true that eyes which have maintained a prolapse of the iris after extraction have ultimately gone to ruin from intraocular inflammation, but that does not prove that the prolapse was the cause, for if so, such results would be much oftener met with."

MEDICAL SOCIETIES.

FOURTH ANNUAL MEETING OF THE WESTERN OPHTHALMOLOGICAL AND OTO-LARYNGOLOGICAL ASSOCIATION,

HELD AT NEW ORLEANS, LA., FEBRUARY 10–11, 1899.

Discussion on paper read by DR. B. E. FRYER, of Kansas City, Mo., entitled "*Profuse Hæmorrhage Subsequent to Extraction of Senile Cataract.*" (See issue February, 1899. page 33).

DR. REYNOLDS suggested the propriety of the hypodermatic injection of the muriate of pilocarpin and the subsequent exhibition of ergotin. He had encountered no such disastrous hæmorrhage as that described in the essay, and doubted if in such a case as described, the hæmorrhage could have been arrested by any possible means in time to save the eye; but in less severe cases he had seen the value of pilocarpin and ergotin.

He could find no language suitable to express either his surprise or condemnation of the practice of using morphine in cases of either primary or secondary hæmorrhage.

DR. DAYTON stated that Dr. Fryer's paper was a very carefully prepared one, and the doctor's question on hæmorrhage following senile extraction should be carefully inquired into as to the causation. As to the condition which one is liable to find in each individual case reported—and by this is meant the condition of the eyeball, is it normal, or as in the case of Dr. Fryer, is it glaucomatous?—would we be expected to find hæmorrhage following extraction in an eye in which the tension is minus or slightly so, where we might possibly expect to find the vitreous fluid; or would we expect to find in an eye with a plus tension hæmorrhage following extraction? He did not remember whether the Doctor spoke of the tension

of the eye at the time of the operation. As he understood him, the tension was plus before he did the iridectomy, a year previous to the extraction. He then asked whether it was plus, normal or minus at the time of the operation, and whether the condition of the patient was due to atheroma of the vessels of the patient; in the latter condition, after sudden removal of the lens we might expect hæmorrhage immediately.

In regard to catharsis and medicaments prior to an operation, it has always been his practice to give a good dose of calomel followed by an ounce of Epsom salts, which produces a catharsis which is free, and a good practice as far as medicaments are concerned prior to an operation. He stated that with a view of collecting statistics, any abnormal condition of a cataractous eye prior to operation should be carefully noted, and by so doing, a careful study of these cases could be made, which he considered of importance to ophthalmologists.

Dr. Casey Wood stated that had he known he was to take part in the discussion of this paper he would have brought the notes of a case which he had not published. He was very much interested in the question of intraocular hæmorrhage after cataract extraction, and had listened with pleasure to the article. He then referred to an article on this subject by Da Gama Pinto, which he had translated. There is nothing in the whole range of post-operative accidents in cataract operations that is more alarming than bleeding in these cases, and his own particular case had impressed him very much. They are analogous to the occurrence of cerebral hæmorrhage in the ordinary form of apoplexy. The principle cause in both cases is the diseased condition of the blood vessels. He did not believe that any treatment before or after the extraction had any effect in lessening the chance of hæmorrhage. Every one knows that cerebral hæmorrhage often occurs without any particular exciting cause. The patient may be seized when walking along the street, while in bed or when quietly sitting. The same is true of hæmorrhage after operation; it is impossible to foretell it, and we should not, after having taken the usual precautions, be held responsible or hold ourselves accountable for it.

One of the interesting points in the DaGama Pinto report was that he was able to prove from a microscopical examination that the bleeding came from the choroidal vessels. It is quite

likely that where the bleeding is retinal it appears early, but if from a small choroidal vessel, the blood collects slowly and is less likely to push forward the vitreous and escape externally for sometime afterwards. If we had bleeding from a ruptured retinal artery, we should expect that the bleeding would show itself immediately.

DR. WUERDEMANN said that there is some relation between the glaucomatous condition and bleeding after cataract extraction. He had a specimen to exhibit of subchoroidal hæmorrhage happening twelve hours after a clean iridectomy in a case of glaucoma. This was in an old man, who was very quiet afterwards; there was no vomiting and no exciting cause for the bleeding, except the operation.

DR. ALT remarked that while he had never had an occurrence of hæmorrhage after extraction, he had seen a similar occurrence after abcision of a staphyloma, with probably some glaucomatous increase of tension. When the staphyloma was cut off, the vitreous oozed out and its expulsion was followed by a pulsating stream of bright blood coming evidently direct from the central artery. It was very difficult to arrest, but nothing further occurred. This might show that similar hæmorrhage after a cataract extraction need not always come from the anterior part of the choroid.

DR. ELLETT stated that he had never had this accident to occur to him personally, but, while House Surgeon in Wills' Eye Hospital, he assisted Dr. Risely in the case to which Dr. Fryer referred, and remembered it distinctly. The patient was about 60 years old, with swarthy complexion and a very shallow anterior chamber. He did not recall at what stage of the operation the hæmorrhage occurred, but thought it was immediately after the corneal section was made that the hæmorrhage suddenly appeared and continued for some time in spite of the measures resorted to for its control. The eye was destroyed and enucleation advised, but delined.

In this connection, he described a case on which he had operated recently, in which there was no hœmorrhage, but why it did not occur, he was at a loss to understand. The patient was 60 years of age, with very marked atheroma of the arteries. At the completion of the corneal incision, the patient squeezed very vigorously with his eyelids, and before the speculum could be removed he had gotten rid of the lens and

three-fourths of the vitreous. It was remarkable that no hæmorrhage occurred. The patient finally recovered with useful vision.

DR. FRYER, in closing the discussion, said that he believed Dr. Reynolds had misunderstood him. He did not urge any remedy and did not believe that there was any drug which would prevent with any certainty this accident. If an opiate be used, as suggested by some, its effects should be tested by a preliminary experiment on the patient before submitting him to the operation. Every practitioner knows that opium produces different effects in different individuals, and the effect in each case should be known before operating. If it is used at the time of operating, the narcosis should be kept up until healing of the corneal wound had taken place.

In regard to what Dr. Reynolds stated of the good effects of ergotin, he hardly thought that the Doctor had studied the hydraulic factors which he mentioned in his paper. Everyone familiar with the effects of ergotin knows that where contraction takes place in the vessels, the arterioles especially, there will be a rise of arterial pressure throughout the system, which is the very thing not wanted in these cases. If we produce artificial tension, we are not only likely to have an intraocular hæmorrhage, but may have hæmorrhage in the brain. No one would want to give ergotin or strychnia in such cases for these reasons.

In regard to Dr. Dayton's question as to the tension in his case, it was slightly above normal.

Discussion on paper read by DR. ADOLF ALT, of St. Louis, Mo., entitled "*The Pathology of Cataract, Especially in Its Earliest Stages.*" (See issue February, 1899, page 39).

DR. DAYTON suggested that the subject of Dr. Alt's paper be used by the Program Committee for discussion at the next meeting, as it was such a valuable paper. It would be an excellent subject for a symposium.

DR. ALT, in conclusion, stated he had nothing more to say than that he appreciated very much the remarks made.

Discussion on paper read by DR. RANDOLPH BRUNSON, of Hot Springs, Ark., entitled "*Uric Acid as a Factor in the Causation of Choroiditis.*" (See issue March, 1899, p. 81).

DR. DRIVER said that he had observed a great many cases of choroiditis in patients in whom he could trace no signs of syphilis, and he attributed these cases or some of them to rheumatism or gout.

Discussion on paper read by DR. H. H. BROWN, of Chicago, Ill., entitled "*The Etiology and Importance of Iritis.*" (See issue April, 1899, page 104).

DR. BRUNSON stated that during the past five years he had had exceptional opportunities for observing this class of cases. About four years ago he began to make an examination as to the relative proportion of cases of iritis in syphilis and in rheumatism from his own cases and those of his colleagues of Hot Springs. In 2,350 cases which he had examined, he found that nearly 3 per cent. of the cases of syphilis had had iritis. He did not see the actual stage of the iritis in all the cases, but from the histories and examinations he had found that iritis had occurred at some time in the past, during the secondary stage probably; also that the patients had not, as a rule, had the benefit of active antisyphilitic treatment from the beginning of the disease.

Rheumatic iritis was found to be about 1½ per cent., this being demonstrated by the fact that the patients made a recovery under antirheumatic treatment.

DR. YOUNG stated that he was somewhat disappointed in Dr. Brown's classification. He expected to hear more about gonorrhœal iritis. He could not see why individuals should confess to gonorrhœa and not to syphilis, and he respected the word of the patient in this regard. Some cases that have been attributed to gonorrhœal infection had a peculiarity which he did not understand. He had made no headway without the exhibition of mercury. In one case cited, he had poor results until he had used inunctions; and in another inunction gave temporary relief; but in the midst of this a relapse occurred, causing such severe pain that the man was almost insane. He then gave the patient a subconjunctival injection of salt solu-

tion. The pain soon ceased and the patient made an uninterrupted recovery under continuation of the inunction.

The Doctor then called attention to infantile iritis, which is very destructive of vision and produces very few external symptoms. He described a case in which the vision had been entirely lost through a membranous formation in the pupil.

In answer to Dr. Reynolds' question, he stated that his case was iritis of early childhood rather than of infancy—the patient being 4 years old, and that there was no trace of syphilis in either parent.

DR. ALT said that it was difficult to prove an iritis to be due to gonorrhœa unless one had an acute case to deal with, in which the gonorrhœa was promptly followed by rheumatism, especially in the knees, and this in turn by iritis. Some five years ago he had read a statement by a French writer that gonorrhœa was very frequently the cause of iritis, and since then he had made it a point to question his patients regarding gonorrhœa as well as syphilis and rheumatism. He was astonished at the enormous number of patients with iritis who confessed to gonorrhœa.

In regard to subconjunctival injection of salt solution as used by Dr. Young so effectively in his case, he had never used this, but he had used mercury very frequently, and at one time for a long period in a routine manner, and was often surprised at its rapid beneficial action.

DR. REYNOLDS stated that the question of gonorrhœal iritis, like that of gonorrhœal rheumatism, is a difficult matter to settle. The fact that iritis occurs during an attack of gonorrhœal urethritis, or subsequent to it, is no evidence that the iritis is of gonorrhœal origin. Gonorrhœal infection is not rheumatism any more than rheumatism should be regarded as evidence of gonorrhœal infection. Iritis is one of the rarest complications of gonorrhœal ophthalmia. Medical literature is filled with so much superstition as to indicate a very dangerous degree of credulity on the part of the medical profession. Micro-organisms, or their ptomaines, traversing the lymph channels may lead to disseminate localized inflammations, suppurating or non-suppurating. In cases of so-called sympathetic ophthalmia, there can be little doubt that the disease is at first reflected, by nervous connection, from one eye to the other by means of these fibres of the ganglionic system, coming out of

the cavernous plexus into the ciliary ganglion. Reflex irritation in the fellow eye may develop a gradually increasing hyperplasia, or it may lead to circumscribed serous effusion. The exact connection between the primary lesion and the ultimate sequelæ is difficult in our present state of knowledge to establish upon a satisfactory basis.

In reference to infantile iritis, he had often observed in a child less than 8 days old characteristic gummatous iritis, accompanied by syphilitic roseola. Examination of the mother disclosed the presence of the eruption well characterized. Thus it may be seen that the stage of evolution of syphilis in the mother and her new-born infant exactly correspond. This is an observation he has often made at the Louisville City Hospital, and which he has seen at the lying-in establishments of other cities. It may be seen any day at the Lying-in Hospital in Paris.

Many cases of iritis in syphilized persons are due to miasmatic infection, and are wholly independent of the presence of syphilis in their origin and course.

DR. BROWN, in closing the discussion, said that in reviewing the literature of gonorrhœal iritis he found very conflicting opinions. The case reported was the only clearly-defined one he had ever seen, and he was of the opinion that true gonorrhœal iritis is rare.

The subject of sympathetic ophthalmia is as yet a very unsettled one, especially as to the mode of transmission from the injured to the healthy eye, but from the results of a fairly thorough review of this subject, he could see no reason why we could not suspect a trophic influence acting through the nervous system, thus directly or indirectly producing the secondary or sympathetic trouble.

Discussion on paper read by DR. W. E. DRIVER, of Norfolk, Va., entitled "*Best Vision After Cataract Extraction.*" (See issue April, 1899, page 113).

DR. FRYER congratulated Dr. Driver on his paper and said that to quite a number it may seem that many of the means he adopts and of the details he carries out are not always essential, yet the result is so important that anything which may interfere with microbic infection and prevent in-

flammation should be given every effort in order to obtain good results. Like other men, he had his hobbies, and if he rode one more than another it was in the matter of antisepsis. He used for a long time the bichloride solution for the eye, but for the antiseptic preparation on the eyeball he now uses protargol, and where it is impossible for the patient to come to the office, he felt perfectly safe in placing it in the hands of the patient for his own use.

He did not believe in simple extraction. He had seen many cases of some of the best operators living, and there was always a certain proportion of prolapsus of the iris, even in the most careful operator's hands, and for this reason, and with the view of avoiding the prolapsus, he thought preliminary iridectomy, as he had done for years, offered the best chance for safety. With preliminary iridectomy, the prolapsus is avoided.

In regard to the speculum, he had abandoned this and used the lid retractors, and while it may seem to those who have never used them that the assistant would be in the way, this is not the case if the assistant is at all skillful; and the point which Dr. Driver makes in regard to the pressure in taking off the speculum is avoided. It has been impossible so far to construct a speculum which will prevent this.

DR. ALT stated that he did not wish to discuss Dr. Driver's method of carrying out cataract extraction, as every man had his own method and considered it the best. However, he wished to make an objection to one of his statements, because he used to think the same way, and to blame himself for not having succeeded in sterilizing the conjunctival sac completely. It has been proven time and again by careful experimentors that it is impossible to sterilize the conjunctival sac absolutely. As he had made repeated study, especially of the retrotarsal fold with the many openings of the ducts of the lachrymal glands, which, as a rule, contain microbes, he now easily understood why the conjunctival sac can not be fully sterilized. We certainly, however, do by means of germicides interfere with the activity of the microbes. This may relieve us of the necessity of laying blame to ourselves for a microbic infection, which may take place after operation, in spite of everything having been done to thoroughly sterilize the locality and the instruments used, etc. We need not, therefore, always con-

sider such an occurrence as due to our fault, as it is due to Nature's own obstacles placed in our way when striving to sterilize the conjunctival sac

DR. MULLEN stated that in the discussion of the technique of cataract operation, in preparing the iris, etc., one of the very important structures in connection with the eye had been overlooked by Dr. Driver—the drainage apparatus. No mention of this apparatus had been made, nor of thoroughly cleaning it. He said it was absolutely necessary to examine the patient's nasal cavities; they all understood how an acute coryza will affect the eyes, and in preparing the drainage apparatus he cleaned it from above downward, washed it thoroughly and then had the patient use a solution of boracic acid as a nasal wash for several days preceding the extraction. He considered it extremely important to have the patient under control while operating for cataract. The average patient does not know the requirements of the operator and does not realize the importance of looking in one direction and holding his eye in that manner until told to change its position. He followed the method of Dr. Fox, making his patient look out, in, up and down. By this procedure he was enabled to have the eye operated upon under complete control, so that the danger of accident from sudden turning of the eye is greatly miminized.

DR. R. C. HODGES, in regard to rendering the eye thoroughly aseptic and to what extent inflammatory reaction may follow the simplest operation, described a case he had lost. A year previous he had operated for senile cataract. A small band of opaque capsule interfered with perfect vision. After preparing the patient, he used a Knapp knife needle and gently divided the band of the capsule. There was no reaction nor pain, and he instilled a drop of atropin solution, bandaged the eye and sent the patient home. The instruments used were new and properly sterilized. The operation was done at about 11:30 A.M. The following day the patient came to his office a picture of suffering, and on removing the dressing he found the cornea opaque and infiltrated, the entire eye presenting every evidence of purulent inflammation. In less than 48 hours the destruction of the eye was complete. The process was more rapid than in any case he had ever seen.

The case shows that even after every precaution has been

taken to secure asepsis, there is danger, and it further emphasizes the necessity of guarding against infection even in the simplest surgical procedure about the eye.

DR. DRIVER, in closing the discussion, stated that the points brought up by some of the gentlemen were very good. He considered the best germicide so far to be the bichloride of mercury, but admitted that occasionally it will set up irritation, when he then resorted to a solution of borax.

The lid retractors were very practical, though he had very little confidence in assistants. He admitted that it was impossible to make the conjunctival tract absolutely aseptic, but he was enabled to inhibit the action of the ordinary microbe long enough for the corneal wound to heal.

He thought the cutting of the lashes had a bad effect, as this irritated and tended to produce a profuse secretion. Instruction of the patient he considered desirable, but preferred with it the administration of bromide. He emphasized the importance of allowing the cataract to thoroughly ripen before attempting operation.

Discussion on paper read by DR. H. V. WUERDEMANN, of Chicago, Ill., entitled "*Operative Treatment of High Myopia.*" (See issue April, 1899, page 127).

DR. CASEY WOOD referred to an article by himself on the "Operative Treatment of Myopia," published in THE AMERICAN JOURNAL OF OPHTHALMOLOGY, 1889. This was chiefly a translation of Fukala's original contribution to *Graefe's Archiv*, and at the end of the translation is a reference to a case operated on by the removal of the lens by an ophthalmologist of Chicago. The same year he had a satisfactory experience with a young subject who had eighteen dioptres of myopia in each eye. This is the first published case treated after the Fukala plan in America.

His experience with this case led him to think that the most important thing about the operation is the first incision into the capsule; when one operates upon such a subject, especially if the patient be under 40 years of age, it is impossible to tell after the incision has been made through the capsule what is going to happen. The reaction may be very slight—almost *nil*, but when the aqueous humor comes in contact with

the lens substance, it may also be followed by glaucoma or an iritis, and the visual result after these complications is often not as good as if one had, perhaps, been more careful. The proper procedure, in his opinion, is to make a central incision and then wait 48 hours before doing anything further, even if there be no apparent result. A second needling may not be called for until weeks have elapsed, but if it be indicated the opening may be increased in size. Peripheral incisions are dangerous and should not be made until late in the case. As soon as the lens has become thoroughly opaque and is practically absorbed, its removal may be accomplished (if the eye be quiet) by a large corneal incision—an incision that may, with advantage, be combined with irrigation.

Another point of importance to which he called attention referred to a case now under treatment in which there are 14 dioptres of myopia in one eye, while the other eye is almost emmetropic. Here is a difficulty which is extremely hard to overcome, and he did not know what the outcome could be, whether the patient would eventually secure binocular vision or not. So far as the removal of the lens without accident is concerned, that had practically been accomplished, the patient being able to read Jager II, and Snellen $^{6}/_{XVIII}$, without glasses.

Dr. Alt stated that he had made a number of these operations, and could only agree with what the Doctor said. He had operated on a case almost as long ago as that of Dr. Wood's. In this case there was perfect success in one, but detachment of the retina resulted in the fellow eye. In the first eye, which turned out well, the myopia was about 20 dioptres. The patient is now enthusiastic, for with a weak convex lens, $2^{3}/_{4}$ dioptres, he is enabled to do fine work; before, he was in a deplorable state, he could not use his heavy concave glasses for any length of time, yet only reluctantly consented to operation. The operation on the first eye being so successful, he desired operation on the other. The second eye, however, was not as healthy as the first, and detachment of the retina followed. The patient is, nevertheless, extremely grateful for the restored sight of the one eye. He had since operated on a number of cases and had no further such occurrence.

Dr. Wuerdemann, in closing, stated that in the first operation it was certainly essential to make a minute central incision into the lens capsule. He waits several weeks before

making a second operation. In one of his cases there was very rapid swelling of the lens and signs of impending glaucoma in both eyes and he had to remove the lens at once. Caution is certainly necessary in the matter of operating for myopia. The patients describe themselves as having a new world opened to them.

He stated that the operation was at first received with disfavor by the medical profession abroad, as statements of patients had found their way into newspapers, and several eminent ophthalmologists had been accused of "advertising" on this account.

Discussion on paper read by DR. DUDLEY S. REYNOLDS, of Louisville, Ky., entitled "*The Treatment of Acute and Chronic Glaucoma.*" (See issue May, 1899, page 129).

DR. ALT stated that he was opposed to the idea that an obstruction of the channels in the iris angle is not at least one of the main features of glaucoma, if not the cause. He used to think that this was not the case until he had han much experience with the examination of specimens of glaucomatous eyes, and he now firmly believes that the blocking up of the channels in the iris angle leads to glaucoma. A glaucomatous attack may also take place when the iris angle itself is wide and not obliterated by the agglutination of the iris to the corneo-scleral tissue, and be due to the fact that cells and cell débris are caught in the spaces of the ligamentum pectinatum. He had seen such cases in which there was a wide-open iris angle, but the filtration channels were filled with cells and particles of cells so as to interfere very materially with the filtration of fluids. He was satisfied that such a blocking of the lymph channels, whether these enter into Schlemm's canal or not (a point not yet settled), produces increase of tension. Later on, new connective tissue is formed—at first loose and fine, but which gradually becomes more firm, contracts and attaches the periphery of the iris to the ligamentum pectinatum. Thus the spaces in the ligamentum pectinatum and Schlemm's canal become obliterated, and in their place we find, where the filtration angle should be, a dense tissue consisting of atrophied iris and newly-formed connective tissue firmly attached to the sclero-corneal tissue.

Another point to which Dr. Reynolds referred is the glands which secrete the aqueous humor. Dr. Alt supposed he referred to Collins' so-called glands of the ciliary body. Dr Alt denied the existence of these glands; he had never found any lumen in these pigmented cell pegs, but he believed that it is pretty well established that the whole inner surface of the ciliary body and of its numerous processes secretes the aqueous humor. He had never seen the choroiditis of which the author assures us that it produces the contraction of the visual field. He thought this contraction was rather due to the pressure against the peripheric nerve-fibers in the optic nerve papilla. Simple evacuation of the aqueous humor can produce no lasting good in glaucoma because it does not really remove the cause, that is the blocking up of the filtration angle. It will remove for a time the surplus fluid. The aqueous humor can not again find egress when the corneal wound is firmly healed.

Dr. Fryer said he was very much pleased with Dr. Reynolds' paper, and while most of the theories advanced were not new, they were ingenious; while he disagreed with the Doctor considerably, still the matter of glaucoma, the essential cause of it, was anything but settled. He agreed with Dr. Alt in regard to Fontana's spaces, and while they may not be lymph channels, they are rarely free in glaucomatous conditions.

In regard to mydriasis, which is often found in acute glaucoma and, as stated by Dr. Reynolds, was due to some change in the ciliary muscle, he was of the opinion that were this true the paracentesis of the cornea, while it would not produce complete relief from the condition, would produce temporary miosis, provided that the mydriasis was not the result of the exudation, but due to the intraocular tension. This mydriasis is relieved every time we do paracentesis of the cornea.

Regarding constitutional treatment, he agreed with Dr. Reynolds, and considered it very essential. Occasionally, we can do well with just such a treatment without operation, yet the latter must not be delayed too long. He had yet to see a case of chronic glaucoma improved by any form of operation.

Dr. Alt stated that the effects of the miotic are the same as those of the paracentesis. By the contraction of the sphinc-

ter, the periphery of the iris which is either only lying loosely against the ligamentum pectinatum, or is attached to it by a loose and newly-formed weak connective tissue, is pulled away. This is the only way in which he could understand the cases in which real relief is obtained after having used a miotic for a day or two.

DR. REYNOLDS, in closing the discussion, said that he felt thankful to the gentlemen who honored him with their opinion, He felt, however, utterly incapable of comprehending Prof. Alt's explanation of the manner of eliminating waste products, and other foreign matter from the anterior chamber of the eye. It would seem from his explanation that there must be small openings, just like pin-holes, in the inter-pectineal spaces of the ligament that binds the iris to the cornea. If these apertures are veritable sinuses leading from the pectineal grooves into Schlemm's canal, constituting so many sewers for draining waste products from the anterior chamber into the canal, how does Prof. Alt propose to account for the escape of these matters? Schlemm's canal, being occupied exclusively by a plexus of veins, containing no eliminating organs, in fact, lymphatic vessels are not present. Can it be possible the advocates of the so-called angle of filtration, through the pectinate ligament, have traced some outlet from Schlemm's canal through the scleral wall?

It is amazing to hear learned gentlemen talking about the secreting functions of the iris and the ciliary processes. Nature has provided glandular organs in different parts of the body, and to these alone are committed all the functions of secretion. The ciliary processes are so many pigmented elastic connective tissue fibers, projected from the ciliary body into the convolutions of the anterior surface of the capsular ligament of the lens, with which they unite by fusion. These fibers can not perform any functions of secretion or elimination. As to the matter of intraocular absorption and filtration, there is no reason upon which to base the supposition that tissue changes, secretion and absorption take place within the eyeball in any manner different from similar functions in any of the other structures of the animal economy. Neither is the ciliary muscle to be regarded as a part of the uveal tract. This structure is as incapable of taking part in the secreting and excreting functions of the body as any other invol-

untary muscle. The complex processes of tissue change, the removal of waste products through the lymphatic system and the glandular organs fully account for all the changes that take place within the cavity of the eyeball.

If it is true that the aqueous of the eye dissolves the fibrin of the blood, detached endothelium and other morbid products, it is not reasonable to suppose that it is just as capable of carrying away the so-called albuminous fluid found in the anterior chamber of the glaucomatous eye? The statement that evacuation of the aqueous humor contracts the pupil, does not apply to those structural changes in the iris occurring in the course of inflammatory glaucoma. It is a perfectly reliable test of the necessity for iridectomy when the pupil resists the action of miotics. There is not the least reason to believe that the size of the pupil merely has any relation either to the nutrition of the eye or to the tension present in glaucoma.

He believes that the pressure of the infiltrated ciliary muscle in cases of inflammatory glaucoma so disturbs the nutrient nerves passing to the ciliary body as to result in diminished aqueous secretion, which he thinks accounts for the shallow anterior chamber so often found in glaucomatous eyes. That variations in the amount of aqueous humor present in healthy eyes are observed, he did not dispute, neither did he find himself sufficiently acquainted with Nature's plan of organization to know why there should be in the eyes of any individual, sometimes more and sometimes less aqueous humor present.

Discussion on paper read by DR. J. A. MULLEN, of Houston, Texas, entitled "*The Percentage of Color-Blindness to Normal Color Vision as Computed from 308,919 Cases.*" (Paper not received).

DR. YOUNG stated that this was an interesting subject because it seems to hold out and confirm the views which were expressed in a paper published by Drs. Fox and Gould in THE AMERICAN JOURNAL OF OPHTHALMOLOGY on "The Theory of Color Perception." As this paper was undoubtedly familiar to many, he would not go into details. The fundamental idea advanced was that the question of color perception was largely a question of thermal registration by the retina. The question

of the distinction between the different colors was in exact proportion to the heat-producing powers of the rays of the spectrum. He noticed that the percentage of color-blindness was higher in Sweeden than in other countries, which was in accordance with the ideas of Fox and Gould. This was demonstrated by materially reducing the temperature of the eye, when the color power of the eye would be reduced.

DR REYNOLDS said the statistics referred to in the essay as gathered from different sources and from different countries are about as valuable as statistics usually are. They chiefly serve the purpose of proving the author's theory, whatever that may be. In his judgment the most valuable contribution which has yet been made to the subject is a work entitled "Color Vision," by Captain Abney, of the Royal Engineers.

In determining the color perception, whatever method may be selected, the distance of the test object as well as its character must be taken into account. The test objects taken in the hand afford much less reliable information than those placed beyond the range of accommodation. The physical and mental condition of the person undergoing the test should be noted, as it has been found that gastro-intestinal disturbances, chronic constipation and various neurotic states, and even prolonged loss of sleep disturb the discriminating powers of the eye. It is equally well known that certain forms of astigmatism, uncorrected, interfere with the discrimination of colors. If all the tests were made in a clear atmosphere and by one method, including all the adult population of large communities, the tests would then be valuable, in fact, conclusive. But where the tests which are made of those male adults seeking positions in the army, navy, marine or railway service are alone to be counted, and the loose methods of testing which prevail in some sections—with Holmgren's worsteds, colored balls and test-letters—at all sorts of varying distances and in varying states of the atmosphere, along with the lantern tests made in dark rooms, we shall be at sea in reference to this matter.

He stated he now had in process of publication an article on this subject, which was in the hands of Dr. Ellett, of the *Memphis Lancet*, in which he claims, from what seem to be entirely reliable sources of examination, about 4 per cent. of impaired color perception, whilst Dr. Mullen finds less than

half that amount from what he assumes to be entirely reliable data. He trusted that the importance of this subject would serve to keep it before the profession until more satisfactory conclusions can be reached.

DR. MULLEN, in closing the discussion, stated that his object in writing and presenting this paper was that he had always considered the average percentage of color-blindness, as given in our text-book, too high, and with this idea he had made his investigations, and had found such to be the case.

In reference to Dr. Reynolds' question, he stated that the statistics were obtained from the examination of men making application for admission to the navy, as being the most reliable. The tests were uniform, and upon subjects who were rigidly examined as to their physical condition before entering the navy. The other statistics, while they were practically the same, he did not think were as valuable as those obtained from the Recorder at Washington. The United States he found to be the only government in the world that required an examination for the color sense for admission into the navy, even England and France having no such regulation.

In reference to Dr. Reynolds' remarks about constipation, indigestion, etc., influencing the color sense, he was totally unfamiliar with any such influence, and stated that in every-day life it is a common fact that females are more constipated than males, and that their color sense is more developed than in the latter, which would imply that torpidity of the bowels, etc., does not affect the color sense sufficiently to warrant any notice.

In answer to Dr. Reynolds' question as to what educational requirements were essential in those making application, the first consideration for admission is that the applicant must be able to read and write; as regards further education, he did not know. He had noticed that in the examination of men who were candidates for officers in the navy (naval cadets), the percentage of color-blindness was extremely small, which could probably be attributed to the fact that they had undergone three or four physical examinations before having arrived at that stage in the navy.

Discussion on paper read by DR. CASEY A. WOOD, of Chicago, Ill., entitled "*Glioma of the Pons, with Report of Autopsy and Microscopical Examination.*" (Paper not received).

DR. ALT stated, regarding the question of glioma and sarcoma, that he had always held that glioma was nothing more than small round-cell sarcoma, and he was not now inclined to differ from this opinion, although Greef, by Golgi's method, had shown spider cells. He had not worked with Golgi's or Cajal's methods because he thought it impossible when staining by these methods to differentiate between artefacts and real existing conditions.

PAMPHLETS RECEIVED.

"On a New Method of Autophthalmoscopy." By Pedro de Obarrio, M.D.

"On Congenital Cataract in the Rabbit." By Pedro de Obarrio, M.D.

"A Case of Extensive Chronic Empyema of the Frontal and Ethmoidal Sinuses, with Exophthalmos; Operation; Recovery." By Arnold H. Knapp, M.D.

"A Case of Acute Mastoiditis (Bezold Variety) Without Perforation of the Drum-Membrane; Operation; Recovery." By Arnold H. Knapp, M.D.

"The Value of Repeated and Differently Placed Exposures to the Roentgen Rays in Determining the Location of Foreign Bodies in and About the Eyeball." By Charles A. Oliver, M.D.

BOOK REVIEWS.

AN AMERICAN TEXT-BOOK OF DISEASES OF THE EYE, NOSE AND THROAT. Edited by G. E. DeSchweinitz, A.M., M.D. and B. Alex. Randall, A.M., M.D, Ph.D. Illustrated with 766 engravings, 59 in colors. Philadelphia. 1899. W. B. Saunders, 925 Walnut St. Price: Cloth, $7; Sheep or Half Morocco, $8.

This book, the different articles of which are written by sixty-two mostly well-known authors, including the editors, is a most excellent addition to any doctor's library. Valuable alike to the older practitioner and to the student of ophthalmology, it can also safely be used by any practitioner as a reference hand-book. Every article is comprehensive and gives the most modern views on the subject it treats of. If there is anything we should have to criticise, it is that the book contains too much. Make-up and illustrations are of the best.

DISEASES OF THE EYE. A Hand-Book of Ophthalmic Practice for Students and Practitioners. By G. E. DeSchweinitz, A.M., M.D. Illustrated with 225 engravings and 2 chromo-lithographic plates. Third Edition, thoroughly revised. Philadelphia. 1899. W. B. Saunders, 925 Walnut St. Price: Cloth, $4; Half-Morocco, $5.

While in the general arrangement the third edition of this well-known and so deservedly well-received text-book seems to be the same, it has been augmented by quite a number of paragraphs on new subjects, particularly concerning the bacteriology of the conjunctiva and cornea. We can only reiterate the praise which we bestowed on this book in its former editions.

OCULAR THERAPEUTICS FOR PHYSICIANS AND STUDENTS. By F. W. M. OHLEMANN, M.D. (Minden, Germany). Translated and edited by CHARLES A. OLIVER, A.M., M.D. Philadelphia. 1899. P. Blakiston's Son & Co., 1012 Walnut St. Price, $1.75.

The completest list of methods and remedial agents applied in the treatment of eye diseases is to be found in this book. It is methodically arranged and special subjects can therefore be easily referred to. The translator has done his English-speaking confrères a great service by his work. In a second edition it will be well to have the Latin somewhat improved in places.—(aquæ chlorita, aquæ calcaria, hydrargyri chloridi mite, etc.; also synechiæ scintillans, etc.).

TEXT-BOOK OF OPHTHALMOLOGY. By DR. ERNEST FUCHS, Vienna. Translated by DR. A. DUANE, New York. With 277 illustrations. Second American edition. New York. 1899. D Appleton & Co

At its first appearance Professor Fuchs' text-book has, by its completeness and excellent detail, not only won the highest encomiums in the ophthalmic press, but also gained an immediate popularity. It is, therefore, not so astonishing to see that this, the second American edition corresponds to its seventh German edition. The additional remarks of the translator are intended to make the book more useful to its American readers. It is most assuredly one of the best text-books on ophthalmology.

ATLAS OF THE EXTERNAL DISEASES OF THE EYE, Including a Brief Treatise on the Pathology and Treatment. By DR. O. HAAB, Zuerich. Translated from the German. Edited by G. E. DESCHWEINITZ, A.M., M.D. With 76 colored plates and 6 engravings. Philadelphia. 1899. W. B. Saunders. Price $3.00.

Among the different atlases published from translations of German atlases (Lehmann) this one is of especial value to teachers and students in ophthalmology. While some of the colored plates are not all that could be desired, others are real works of art and good reproductions of nature. The text accompanying these pictures is thoroughly good.

PRACTICAL HAND-BOOK OF THE MUSCULAR ANOMALIES OF THE EYE. By H. F. HANSELL, A.M., M.D. and W. REBER, M.D. Illustrated with 28 engravings and 1 plate. Philadelphia. 1899. P. Blakiston's Son & Co. Price, $1.50.

A concise and plain description of all that seems to be known about this subject with all its intricate problems. The book is practical and a safe guide to the student.

DIE MAGNET-OPERATION IN DER AUGENHEILKUNDE. NACH EIGENEN ERFAHRUNGEN. (THE MAGNET-OPERATION IN OPHTHALMOLOGY. FROM PERSONAL EXPERIENCE). By PROF. DR. J. HIRSCHBERG. Second Edition. Illustrated with 30 engravings. Leipzig. 1899. Veit & Co. Price, 4.40 marks.

More than 200 magnet-operations are detailed in this book, which should be read by every oculist. It is only natural that Hirschberg should prefer his own magnet to those constructed by others, and he shows that many a so-called Hirschberg magnet which was found to be wanting, was in reality not what it purported to be. Surely, the author is to be congratulated on the results obtained by his hand with his magnet. ALT.

RETINOSCOPY (OR SHADOW-TEST) In the Determination of Refraction at One Meter Distance, With the Plane Mirror. By JAMES THORINGTON, M.D., Adjunct Professor of Diseases of the Eye in the Philadelphia Polyclinic and College for Graduates in Medicine; Assistant Surgeon to Will's Eye Hospital, Etc. Third Edition, revised and enlarged, with 43 illustrations, 12 of which are colored. Philadelphia. 1899. P. Blakiston's Son & Co., 1012 Walnut St. Price, $100.

The third edition of Dr. Thorington's popular manual on "Retinoscopy" has just been issued. Its great success is shown by the fact that three editions have been called for in less than two years. This manual presents a clear and practical description of the shadow-test and is highly recommended to college students, post-graduates, and to ophthalmologists who desire to acquire at home a working knowledge of this invaluable method. J. E. J.